



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/502,091

07/22/2004

Hiroaki Sudo

L9289.04147

4015

24257 7590 01/29/2009

Dickinson Wright PLLC  
James E. Ledbetter, Esq.  
International Square  
1875 Eye Street, NW., Suite 1200  
WASHINGTON, DC 20006

EXAMINER

BRANDT, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2617

MAIL DATE

DELIVERY MODE

01/29/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/502,091	<b>Applicant(s)</b> SUDO, HIROAKI	
	<b>Examiner</b> CHRISTOPHER M. BRANDT	<b>Art Unit</b> 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 30-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 19, 2008 has been entered.

### ***Response to Amendment***

This Action is in response to applicant's amendment / arguments filed on November 19, 2008. **Claims 30-42** are now currently pending in the present application.

### ***Response to Arguments***

Applicant's arguments with respect to claims 30-42 have been considered but are moot in view of the new ground(s) of rejection.

### ***Drawings***

Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 30-42** are rejected under 35 USC 103(a) as being unpatentable over **Walton et al.** (US PG PUB 2003/0081538 A1, hereinafter **Walton**) in view of **Arai et al.** (US Patent 6,456,607 B2, hereinafter **Arai**) in view of **Sakoda et al.** (US PG PUB 2002/0118659 A1, hereinafter **Sakoda**) and further in view of **Baum et al.** (US PG PUB 2003/0112744 A1, hereinafter **Baum**).

Consider **claim 30**. Walton discloses an OFDM-CDMA transmitting apparatus comprising:

a spreading section that spreads transmit symbols and makes a spreading ratio of a specific transmit symbol larger than a spreading ratio of other transmit symbols (figure 3 paragraphs 10, 11, 29, 109, read as read as a data spreader at a transmitter unit to spread the coded data for each user with a respective set of one or more spreading codes. Walton also discloses different spreading factor of SF being used for a data rate. Particularly, Walton

Art Unit: 2617

discloses that lower data rates may be accommodated by power scaling the data such that the transmit power per frame is proportional to the data rate based on different spreading factors); and

an orthogonal frequency division multiplexing section that distributes the multiplexed spread signals among a plurality of subcarriers (paragraph 102, read as the spreader is supplied with the multiplexed coded data from the multiplexer and transmitted).

Walton discloses the claimed invention but fails to explicitly teach a number of multiplexing selection section that selects a number of multiplexing for each transmit symbol and makes a number of multiplexing for the specific transmit symbol smaller than a number of multiplexing for the other transmit symbols; and a multiplexing section that multiplexes spread signals of said each transmit symbol by the selected number of multiplexing.

However, Arai teaches a number of multiplexing selection section that selects a number of multiplexing for each transmit symbol and makes a number of multiplexing for the specific transmit symbol smaller than a number of multiplexing for the other transmit symbols; and a multiplexing section that multiplexes spread signals of said each transmit symbol by the selected number of multiplexing (figure 1 block 112, figure 2 block 210, figure 5 block 501 and 502, figure 6 block 601 and 602, column 6 lines 47-50 and 54-57, column 7 lines 10-13, 26-28, 38-42, column 9 lines 42-58, column 10 lines 1-5, 47-61, column 11 lines 6-10, 14-20, read as The significance discriminating circuit 111 discriminates a significance factor of the transmission data in accordance with the predetermined value or manually set value, and supplies the discrimination result to the multiplex number control unit 112. The multiplex number control unit 112 sets a multiplex number corresponding to the significance factor and sends it to the

Art Unit: 2617

spread spectrum communication unit 109, where the significance factor of data such as control signals required to be reliably transmitted is set highest, and is set lower for audio signals and image signals in this order in accordance with an allowable transmission error rate).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Arai into the invention of Walton in order to control the information amount matching the transmission path conditions (column 1 lines 60-66).

In addition, Walter and Arai fail to teach distributes at least one of chips of the specific transmit symbol whose number of multiplexing has been reduced and chips of the specific transmit symbol whose spreading ratio has been increased.

However, Sakoda teaches distributes at least one of chips of the specific transmit symbol whose number of multiplexing has been reduced and chips of the specific transmit symbol whose spreading ratio has been increased (paragraphs 148, 177, read as frequency-converting the transmission signal into a desired frequency band. Thus, the transmitter 100 performs multi carrier communication for transmitting the information bit stream S100 to be transmitted with pluralities of subcarriers. In addition, the transmitter can stepwise increase transmission power by using only the spread code C55 having one type of a spreading ratio, performing multiplication in parallel correspondingly to the increase of bit rates and thereafter performing multiplexing).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Sakoda into the invention of Walton

Art Unit: 2617

and Arai in order to disperse the transmission signal into the subcarriers and superimpose them (paragraph 148).

Moreover, Walter, Arai, and Sakoda fail to explicitly teach that the distribution is only to subcarriers in a time domain among subcarriers in a frequency domain, subcarriers in the frequency domain and the time domain, and the subcarriers in the time domain.

However, Baum teaches that the distribution is only to subcarriers in a time domain among subcarriers in a frequency domain, subcarriers in the frequency domain and the time domain, and the subcarriers in the time domain (paragraph 16, read as spreading data symbols over a plurality of subcarriers in the time domain and/or frequency domain and time domain).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Baum into the invention of Walter, Arai, and Sakoda in order to reduce multipath fading (paragraph 2).

Consider **claim 31 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein data for which better channel quality is required than for other data is allocated to the specific transmit symbol whose number of multiplexing has been reduced (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 5-15).

Consider **claim 32 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein data for which better channel quality is required than for other data is allocated to the specific transmit symbol whose spreading ratio has been increased (Walton; abstract, paragraphs 29, 109, Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20).

Consider **claim 33 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein the specific transmit symbol whose number of multiplexing has been reduced is

placed at the start of a frame (Arai; figure 15, column 17 lines 62-67, column 18 lines 5-10, 30-45).

Consider **claim 34 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose the specific transmit symbol whose spreading ratio has been increased is placed at a start of a frame (Walton; abstract, paragraphs 29, 109, Arai; figure 15, column 17 lines 62-67, column 18 lines 5-10, 30-45).

Consider **claim 35 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein the number of multiplexing selection section reduces a number of multiplexing of a retransmission symbol in accordance with an increase of a number of retransmissions (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 5-15).

Consider **claim 36 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein the spreading section increases the spreading ratio of a retransmission symbol in accordance with an increase of a number of retransmissions (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 5-15).

Consider **claim 37 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein an M-ary modulation number of the specific transmit symbol whose number of multiplexing has been reduced is made smaller than an M-ary modulation number of the other transmit symbols (Walton; paragraph 37).

Consider **claim 38 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein an M-ary modulation number of the specific transmit symbol whose spreading ratio has been increased is made smaller than an M-ary modulation number of the other transmit symbols (Walton; paragraph 37).



Consider **claim 39 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein the specific transmit symbol whose number of multiplexing has been reduced is inserted periodically (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 53-63).

Consider **claim 40 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein the specific transmit symbol whose spreading ratio has been increased is inserted periodically (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 53-63).

Consider **claim 41 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein the number of multiplexing of the specific transmit symbol whose number of multiplexing has been reduced is made “1” (Arai; figures 13 and 16, steps 1301 and 1601, column 15 lines 11-14, 18-32, column 18 lines 15-25).

Consider **claim 42 and as applied to claim 30**. Walton, Arai, Sakoda, and Baum disclose wherein the spreading section makes the spreading ratio of the specific transmit symbol whose number of multiplexing has been reduced is made “1” (Arai; figures 13 and 16, steps 1301 and 1601, column 15 lines 11-14, 18-32, column 18 lines 15-25).

### **Conclusion**

Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**Hand-delivered responses** should be brought to

Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Brandt whose telephone number is (571) 270-1098.

The examiner can normally be reached on 7:30a.m. to 5p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Application/Control Number: 10/502,091  
Art Unit: 2617

Page 10

Christopher M. Brandt

C.M.B./cmb

January 27, 2009

/George Eng/

Supervisory Patent Examiner, Art Unit 2617